

Cotonou, Benin

March 2026

Dear Professor Riemann,

I am a 23-year-old independent researcher from Cotonou, Benin. I work in a shop during the day and think about mathematics on my computer when time allows. I have no university affiliation, no funding, and no supervisor. I am writing to you across time because I read your 1859 memoir, and I dared to think about it.

What you wrote, in your own words, was not a claim about the number $\frac{1}{2}$ in isolation. You observed that the zeros of $\zeta(s)$ that lie off the real axis appear to have their *real parts* arranged in a particular way — and that it is *very likely* that all of them satisfy this. You wrote it as something you observed, not something you had proved. And I noticed that perhaps the people who came after you complexified the question in ways you never intended.

I tried to attack it directly. I failed entirely. But in failing, I found something I did not expect — a small transformation that I called the Brindel transformation, and through it, I believe I can show why the condition on the real part imposes itself naturally on the series.

The Transformation

For any integer $n \geq 2$, I asked: for which complex s does $n^s = n$? The answer is not $s = 1$ alone. It is the family:

$$s_n^{(k)} = 1 + \frac{2\pi k}{\ln n} i, \quad k \in \mathbb{Z}.$$

Each point has real part exactly 1. The integer n lives, in the complex plane, on a whole family of points — not just at $s = 1$.

Applied to the Series

Take your zeta function $\zeta(s) = \sum_{n=1}^{\infty} n^{-s}$. Substituting s_n (with $k = 1$) into the exponent, the product $s \cdot s_n$ for $s = \sigma + ti$ becomes:

$$s \cdot s_n = \left(\sigma - \frac{2\pi t}{\ln n} \right) + \left(t + \frac{2\pi \sigma}{\ln n} \right) i.$$

The real part of the exponent is $\sigma - 2\pi t/\ln n$.

Where the Condition on the Real Part Imposes Itself

Under the symmetry $s \rightarrow 1 - s$ (that is, $\sigma \rightarrow 1 - \sigma$ and $t \rightarrow -t$), the real part of the exponent becomes:

$$(1 - \sigma) + \frac{2\pi t}{\ln n}.$$

For the series to be *globally* symmetric under $s \leftrightarrow 1 - s$ — meaning coherent for every n simultaneously — the two real parts must be equal:

$$\sigma - \frac{2\pi t}{\ln n} = (1 - \sigma) + \frac{2\pi t}{\ln n}.$$

Rearranging:

$$2\sigma = 1 + \frac{4\pi t}{\ln n}.$$

Since $\ln n$ varies with each n , this equality cannot hold for all n simultaneously unless the n -dependent terms cancel structurally across the entire series. This cancellation is exact and symmetric precisely when:

$$\boxed{\sigma = \frac{1}{2}}$$

At this value, the positive and negative contributions from the n -dependent terms balance exactly for all terms at once. No other value of σ produces this structural coherence.

What I Do Not Know

I do not know if this is what you were seeing when you wrote your memoir. I do not know if this constitutes a proof — I suspect it does not yet, because the step from “the global symmetry of the series requires $\sigma = \frac{1}{2}$ ” to “all zeros lie on $\sigma = \frac{1}{2}$ ” still requires more. But I believe the condition imposes itself naturally from the structure of the series under this transformation, without any external machinery.

Perhaps the people who came after you added too many layers. Perhaps the answer was always close to the surface, in the simple question: what must be true of σ for the series to be coherent under its own symmetry?

I am sending you this letter knowing I will never receive a reply. That is fine. You asked a question in 1859 that I am still thinking about in 2026 from Cotonou, between customers. That alone seems worth acknowledging.

With deep respect and gratitude for the question you left open,

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